

## CHANGELOG for smartmontools

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The most recent version of this file is:

<http://cvs.sourceforge.net/viewcvs.py/smartmontools/sm5/CHANGELOG?sortby=date&view=markup>

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NOTES FOR FUTURE RELEASES: see TODO file.

<ADDITIONS TO THE CHANGE LOG SHOULD BE ADDED JUST BELOW HERE, PLEASE>

smartmontools 5.33 Experimental Release

[BA] smartctl: ATA disks, if SMART ATTRIBUTE THRESHOLDS page has ID errors with some Attributes having NULL IDs, print Attribute info anyway (but issuing a warning to the user).  
  
[DG] [SCSI] Decode Last n error events log page; decode track following and positioning errors [Hitachi]  
  
[EM] FreeBSD: another tweak, packed introduced in Version 5.0040  
  
[EM] Cleaner tweak of fixes for FreeBSD 4.x.  
  
[EM] Fix compilation errors under FreeBSD 4.x, as it is still using and old GCC  
  
[EM] Remove 3ware/FreeBSD specific files and just include pieces we need  
  
[DG] Add logic in smartd to detect 3ware, Marvell controllers and SATA disks behind an ATA-SCSI simulator (in Linux). If specific device types are not given and they are picked in a general SCSI device scan then warn and skip.  
  
[GG] insert correct path to smartd into smartd's init script  
  
[BA] Changed all default paths in documentation to reflect /usr/local as default path prefix. This affects on-line man pages, primarily.

- [DS] Added support for OpenBSD
- [BA] Added another environment variable SMART\_FULLMESSAGE set by the smartd mailing feature, and modified examplescripts/Example1 to illustrate it.
- [BA] Fixed potentially misleading messages of the form:  
XXX failed: success
- [DG] emit warning if SATA disk detected using libata in Linux; then exit
- [PW] Added Seagate U10 family, Hitachi Travelstar 7K60, Fujitsu MHR2020AT, and QUANTUM FIREBALLP AS20.5 to knowndrives table.
- [DG] Detect 3ware and Marvell controllers from SCSI INQUIRY vendor string and suggest usage of appropriate '-d' argument in smartctl.
- [LW] Tested the RELEASE\_5\_33\_WITH\_MARVELL\_SUPPORT branch on actual Marvell 88SX5041 hardware, with success.  
Merged into HEAD.
- [BA] Fixed nasty DEVICESCAN bug
- [BA] Checked in RELEASE\_5\_33\_WITH\_MARVELL\_SUPPORT branch with some Marvell support.
- [BA] Additional modifications of Ed's controller scheme. Fixed broken 3ware support under linux, problems with scanning devices in smartd, and other small problems.
- [EM] Minor change to FreeBSD inclusion of 'twe' include files. Add code to check if they exist in /usr/include/sys to use those in preference to ones added here
- [EM] Very preliminary support attempt for 3Ware controllers under FreeBSD. Also, switched 'escalade\_type/escalade\_port' to 'controller\_type/controller\_port' and moved away from 'tryata/tryscsi' to using new 'controller\*' variables to determine which controller type (ATA/SCSI/3Ware) to use.
- [GK] Added initscript support for Darwin.
- [CF] Windows smartd: Added ability to run smartd as a windows service, including new commands "smartd install ..." and "smartd remove" to install and remove the service registry entry.
- [BA] smartd: warn user if -s regexp regular expression contains characters other than 0123456789.\*()|+?[-]{}:=SLCO since such characters are 'suspicious' and may indicate a poorly formed regexp. Extended regular expression gurus: can this list be reduced somewhat?
- [CF] Fixed bug in Windows smartd: Missing close of config file when configuration is reloaded by smartd daemon.
- [CF] Windows smartd: Added mail warning feature using the "Blat" (<http://blat.sourceforge.net/>) mailer as a default.
- [PW] Added Maxtor DiamondMax Plus 5120 Ultra ATA 33 series and TOSHIBA

MK3017GAP to knowndrives table.

- [CF] Added fixes to build smartmontools on old Linux systems (libc < 6, Kernel 2.0.x).
- [BA] Added ATA minor version identity strings for latest ATA specification updates: ATA/ATAPI-7 T13 1532D revision 4a and ATA/ATAPI-6 published, ANSI INCITS 361-2002
- [PW] Added Hitachi Travelstar 5K80 family and Fujitsu MHTxxxxAH family to knowndrives table.
- [EM] Fix up compilation under FreeBSD < 5.x
- [PW] Added QUANTUM FIREBALL EX3.2A and missing Western Digital Caviar SE drives to knowndrives table.
- [BA] Modified Hitachi Travelstar 80GN family regexp in drive database. Thanks to [GK/CF] for problem & solution.
- [GK] Added os\_darwin.[ch]
- [PW] Added the following drives to the knowndrives table: IBM Travelstar 48GH, 30GN, and 15GN family; IBM Deskstar 37GP and 34GXP family; Western Digital WDC WD272AA; Maxtor DiamondMax D540X-4D family; TOSHIBA MK2016GAP, MK2018GAP, MK2018GAS, MK2023GAS; and QUANTUM FIREBALL ST3.2A
- [BA] smartd/smarctl now print build HOST/OS information as part of startup slogan. This should make it slightly easier to read bug reports from users.
- [RZ] Fixed the DEVICESCAN to do what it was supposed to do - give error message unless scanning is in progress.
- [BA] Update documentation to describe 3ware character devices. Better error detection for missing/malfunctioning devices behind 3ware controllers. Now pack 3ware ioctl structures explicitly.
- [BA] For ATA devices that support LBA mode, print capacity as part of smartctl --info
- [RZ] Made DEVICESCAN quiet about non-existing devices unless debug is on.
- [DG] treat "unit attention" SCSI warning as try again in some contexts (test unit ready and mode sense)
- [BA] on drives that store max/min rather than min/max, get order correct in printing temp.
- [BA] fixed typo in 'smartctl -h' output. Thanks to Gabor Z. Papp.
- [BA] linux: clean-up to 3ware/AMCC support; dynamically create or fix /dev/tw[ae][0-15] device node entries if they don't exist or are incorrect. One can now use the character devices /dev/twe[0-15] OR /dev/sd? for 3ware 6000/7000/8000 series cards. One must use /dev/twa[0-15] for 3ware 9000 series cards. Note that selective self-tests now work via /dev/tw[ae] devices. Next step: documentation.

- [BA] linux: experimental "support" for 3ware/AMCC 9000 series controllers that use the 3w-9xxx driver. This will be in a state of flux for a few days. Note that this requires the character interface /dev/twa[0-15].
- [DG] linux: extend general SCSI OS interface to use the SG\_IO ioctl. If not available, use the older SCSI\_IOCTL\_SEND\_COMMAND ioctl.
- [KS] Solaris/x86: fixed system identification problem in configure script. Thanks to Stuart Swales.

smartmontools 5.32

- [BA] Update link to revised/updated IBM Deskstar Firmware
- [CF] Cygwin & Windows: Added missing ASPI manager initialization with GetASPI32SupportInfo(). Thanks to Nikolai SAOUKH for pointing this out and providing a patch.
- [BA] modified smartd init script to work on whitebox (thanks to Michael Falzon)
- [BA] removed (reverted) additional Attribute definitions from <http://smart.friko.pl/attributes.php>. All (or most?) of these appear to be return code values for the WD Digital Life Guard Utility.
- [PW] Added Seagate Medalist 17242, 13032, 10232, 8422, and 4312 to knowndrives table. Added missing Seagate U Series 5 drives.
- [PW] Added the following QUANTUM models to knowndrives table: FIREBALL EX6.4A, FIREBALL LP AS10.2, FIREBALL LP AS40.0, FIREBALL CR4.3A, FIREBALL LP LM15, FIREBALL LP LM30, and FIREBALL lct20 30
- [PW] Added missing Western Digital Protege drives to knowndrives table.
- [PW] Added Maxtor DiamondMax 40 ATA 66 series and DiamondMax 40 VL Ultra ATA 100 series to knowndrives table.
- [PW] Added the following Hitachi/IBM drives to knowndrives table: HITACHI\_DK14FA-20B, Travelstar 40GNX series, Travelstar 4LP series, and Travelstar DK23XXB series. Added the missing Travelstar 80GN drives.
- [PW] Added Fujitsu MPB series and MPG series to knowndrives table. Added the missing Fujitsu MHSxxxxAT drives.
- [KS] Solaris: added workaround for dynamic change of time-zone.
- [KS] Solaris: fixed problem that autogen.sh cannot detect absence of auto\* tools.
- [BA] smartd: added time-zone bug information to man page. Reverted CF code for \_WIN32 case.
- [CF] Cygwin & Windows: Added better error messages on IDE/ATA device open error.
- [BA] added additional Attribute definitions from <http://smart.friko.pl/attributes.php>

[BA] smartd: reworked TimeZone bug workaround so it is only invoked for glibc. Note: this might not be right -- a similar bug may exist in other platform's libcs.

[DG] SCSI smartmontools documentation updated [2004/5/6]. See:  
[http://smartmontools.sourceforge.net/smartmontools\\_scsi.html](http://smartmontools.sourceforge.net/smartmontools_scsi.html)

[CF] Windows: Fixed reset of TZ=GMT in glibc timezone bug workaround.

smartmontools 5.31

[DG] move SCSI device temperature and start-stop log page output (smartctl) into --attributes section (was in --info section).

[GG] change default installation location to /usr/local

[CF] Cygwin smartd: Fixed crash on access of SCSI devices after fork().

[PW] Added TOSHIBA MK4018GAS and the following Maxtor drive families to knowndrives table: DiamondMax D540X-4G, Fireball 541DX, DiamondMax 3400 Ultra ATA, DiamondMax Plus 6800 Ultra ATA 66.

[PW] Added missing Maxtor DiamondMax 16, DiamondMax D540X-4K, and DiamondMax Plus 45 Ultra ATA 100 drives to knowndrives table.

[PW] Added ExcelStor J240, Hitachi Travelstar 80GN family, Fujitsu MHTxxxxAT family, and IBM Deskstar 25GP and 22GXP families to knowndrives table.

[CF] Cygwin smartd: Added workaround for missing SIGQUIT via keyboard:  
To exit smartd in debug mode, type CONTROL-C twice.

[BA] smartctl: printing of the selective self-test log is now controlled by a new option: -l selective

[BA] Added entries for Samsung firmware versions -25 to -39 based on latest info about firmware bug fixes.

[PW] Added Seagate U Series X family, Seagate U8 family, and Seagate Medalist 8641 family to knowndrives table.

[CF] smartd: Added exit values 5/6 for missing/unreadable config file.

[BA] smartd: now monitor the Current Pending Sector count (Attribute 197) and the Offline Pending Sector Count (Attribute 198). Log a warning (and send an email, if so configured) if the raw count is nonzero. These are controlled by new Directives: -C and -U. Currently they are enabled by default.

[CF] Added option -c FILE, --configfile=FILE to smartd to specify an alternate configuration FILE or '-' for standard input.

[KS] configure.in now searches for -lndl and -lsocket for Solaris.

[CF] Win32/native smartd: Added thread to combine several syslog output lines into one single event log entry.

[CF] Win32 smartd: Added DEVICESCAN for SCSI/ASPI devices.

[GG] Use gethostbyname() the get the DNS domain since getdomainname() returns the NIS domain when sending mails from smartd.

[GG] smartd.init.in: pass smartd\_opts to smartd on startup, read distribution specific configuration files if found

[SS] smartctl: added NetBSD support for Selective Self-tests.

[BA] smartd.conf example configuration file now has all examples commented out except for 'DEVICESCAN'.

[CF] Win32/native smartd: Added ability to display warning "emails" as message box by "-m msgbox" directive. With "-m sysmsgbox", a system modal (always on top) message box is shown.

[BA] smartctl: printing of self-test log for disks that support Selective self-testing now shows the status of the (optional) read-scan after the selective self test. Also, changed format in printing self-test log to print failing LBA in base 10 not base 16 (more compatible with kernel error messages). Also, in printing SMART error log, print timestamps in format days+hours+minutes+seconds.

[CF] Win32 smartd: Added ability to log to stdout/stderr (-l local1/2). Toggling debug console still works if stdout is redirected.

[BA] smartctl: selective self-test log, print current status in a more detailed way. Allow writing of selective self-test log provided that no other self-test is underway.

[BA] Linux: eliminated dependency on kernel tree hdreg.h.

[BA] smartctl: -l selftest option now prints Selective self-test log in addition to the normal self-test log. Added additional options (-t pending, -t afterselect) to control remaining Selective Self-test capabilities. Tested with several Maxtor disks. Modified error message printing so that munged option messages print at the end not the start of output.

[CF] Added daemon support to Win32 native version of smartd. The daemon can be controlled by commands similar to initd scripts: "smartd status|stop|reload|restart|sigusr1|sigusr2".

[CF] Added minor support for option "-l local[0-7]" to Win32 native (not Cygwin) version of smartd. If specified, the log output is written to file "./smartd[1-7]?.log" instead of event log.

[BA] Added Selective Self-test to smartctl (-t selective,M-N). Currently only supported under Linux; Solaris, NetBSD, FreeBSD and Windows developers must add WRITE LOG functionality to os\_\*.c

[BA] Added workaround for an annoying glibc bug: if you change timezones, (eg, flying with a laptop from USA to Europe) localtime() does not notice this in a running executable, so time that appears in the system log (syslog!) will be incorrect. See <http://bugs.debian.org/cgi-bin/bugreport.cgi?bug=48184>

for additional examples of this bug.

[DG] Set explicit timeouts for SCSI commands (most default to 6 seconds). Previously a 0 second timeout was meant to be interpreted as a default timeout but the FreeBSD port had a problem in this area.

[CF] Fixed un-thread-safe exit signal handler for Win32

[BA] Fixed un-thread-safe exit signal handler pointed out by CF.

[BA] Changed configure script to eliminate warnings under Solaris from sys/int\_type.h conflicts with int64.h  
Added header files for umask to smartd.c.

[BA] Man page format change from Werner LEMBERG. " " changed to \&

[CF] Added os\_win32/syslogevt.\* event message file tool for Win32 smartd (native+cygwin). May also be useful for other cygwin programs writing to syslog().

[CF] Added Win32 version of smartd

[CF] Merged RELEASE\_5\_26\_WIN32\_BRANCH

[BA] Made some changes to man page markup suggested by Richard Verhoeven to work around bugs in man2html. Tested not to break anything under Linux and Solaris.

[CF] Moved PrintOut() from utility.c to smart{ctl,d}.c to avoid syslog() output of smartctl.

[BA] Grew worried that some time-zone names could be very long (eg, Mitteleuropaische Zeit) and put date string lengths into a single macro in utility.c

[EM] Updated os\_freebsd.c to handle older versions of FreeBSD in a more appropriate/obvious fashion.

[EM] Modified autogen.sh as FreeBSD installs automake 1.7 as 'automake17' and NOT 'automake-1.7'

smartmontools 5.30

[PW] Added QUANTUM FIREBALLlct15 30, QUANTUM FIREBALLlct20 40, and Maxtor 6Y060P0 (DiamondMax Plus 9 60GB) to knowndrives table.

[PW] Added Maxtor MaXLine II family to knowndrives table (thanks to Brett Russ for submitting the patch).

[BA] Added remaining read/write commands to detailed list of error log commands that have text descriptions of problem printed. For commands that support it, print number of failed sectors at problem LBA.

[BA] Made SuSE section of smartd init script more SuSE 9 compatible. Thanks to Hans-Peter Jansen.

[CF] Windows smartd: Added IDE/ATA device scan  
Added windows device names to smartctl.8.in, smartd.8.in

[BA] smartctl/smartd: user-provided '-F samsung' and '-F samsung2' command line options/Directives did NOT over-ride preset values unless user specified '-P ignore'. Now they will always over-ride preset values from the database.

[BA] Added error decoding for a few more READ and WRITE commands.

[PW] Added Maxtor MaXLine Plus II, Western Digital Caviar SE (Serial ATA) series, Hitachi Deskstar 7K250 series, and Ultra ATA 66 models of the Maxtor DiamondMax Plus 40 series to knowndrives table.

[BA] Added Maxtor Diamondmax 250 GB drives to database. Note that these model numbers are not listed in Maxtor documentation, but they exist.

[BA] Removed the 'contact developers' phrase from the Samsung disk warning messages.

[PW] Added TOSHIBA MK2017GAP, IBM Deskstar 14GXP and 16GP series, Fujitsu MPC series, Seagate Barracuda ATA III family, and missing Seagate Barracuda U Series drives to knowndrives table

[BA] smartd: wrong loglevel for message: Configuration file /etc/smartd.conf parsed. Changed to LOG\_INFO from LOG\_CRIT. Thanks to Emmanuel CHANTREAU for the report.

[CF] Checked in development version of windows code base.

smartmontools 5.29 (note: there was NO 5.28 release)

[BA] smartd: configure script did not set correct directory to search for smartd.conf based on --prefix argument to ./configure. Thanks to GG for identifying the problem and fix.

[BA] make clean now removes man pages (generated from \*.in) files as well as object files.

[EM] Correct copying of sense data in FreeBSD SCSI implementation. Thanks to Sergey Svishchev for noticing the bug.

[BA] On solaris, wrong warning message if no ATA support. Warning message concerns 3ware controller, not ATA.

[SS] Added SCSI support for NetBSD.

[BA] on big-endian linux machines, fixed interpretation of HDIO\_GET\_IDENTITY to correctly identify ATAPI bit (was byte swapped). This should eliminate some SYSLOG noise if user queries a packet device (eg, CD ROM or DVD reader).

[PW] Removed warning for IBM Deskstar 40GV & 75GXP series drives with A5AA/A6AA firmware. Thanks to Gerald Schnabel.

[PW] Added Toshiba TOS MK3019GAXB SUN30G to knowndrives table

[PW] Added Western Digital Caviar AC12500, AC24300, AC25100, AC36400, and AC38400 to knowndrives table

[BA] When printing ATA error log, print the LBA at which READ

or WRITE commands failed.

[BA] Changed syntax of error message in smartctl

[BA] Added versioning info (-V options to smartd/smartctl) for Solaris ATA module.

smartmontools 5.27

[KS] Added ATA/IDE support for Solaris/SPARC (ATA/IDE not yet for Solaris/x86).

[BA] 3ware controllers: documented that one can monitor any of the physical disks from any of the 3ware /dev/sd? logical devices. Better warnings if querying a disk that does not exist.

[PW] Added Hitachi Travelstar DK23DA series, Maxtor DiamondMax Plus 40 series, Western Digital Caviar WDxxxAA, WDxxxBA, and WDxxxAB series to knowndrives table

[BA] missing 'pragma pack' on ATA IDENTIFY DEVICE structure may have caused odd or incorrect results on 64-bit machines.

[BA] smartctl/smartd allow inspection of self-test and error logs even if disk firmware claims that these don't exist. This is needed for some Maxtor disks whose firmware does not indicate log support even though the disk DOES support it.

[BA] Improved porting instructions and documentation in os\_generic.c

[PW] Add Western Digital Caviar WD136AA and SAMSUNG SP40A2H (RR100-07 firmware) to knowndrives table.

[EM] FreeBSD: remove extra definition of FreeNonZero

[BA] smartctl: the -q silent option was printing output for some error conditions. Fixed. Will rename relevant variables to help avoid these errors in the future.

[SS] NetBSD port added.

[BA] more sensible error messages for devfs and devfs-like systems. Instead of saying that the DIRECTORY does not exist, say that the DEVICE does not exist.

[BA] smartd: added -n Directive, to prevent disk spin-up depending upon the power mode (SLEEP, STANDBY, or IDLE).

[PW] Added Maxtor DiamondMax 20 VL series, Fujitsu MPF series, Maxtor DiamondMax 36 series, Maxtor DiamondMax 4320 series, and Maxtor DiamondMax 536DX series to knowndrives table.

[BA] many warning messages now give the file name AND VERSION

[BA] smartd: when the user provides multiple address recipients to the '-m' Directive in a comma-delimited list, the commas are stripped out before passing the list of addresses to the mailer program. (Thanks to Calin A. Culianu for pointing this out and providing a patch.)

- [BA] smartd: when the '-M exec path' Directive is used, any stdout OR stderr output from the executable "path" is assumed to indicate a problem, and is echoed to SYSLOG.
- [BA] Added all missing IBM/Hitachi Deskstar 180GXP models to knowndrives table.
- [PW] Added some missing IBM/Hitachi Deskstar 120GXP models to knowndrives table.
- [PW] Added IBM Travelstar 14GS to knowndrives table.
- [PW] Modified knowndrives table to match entire Hitachi Travelstar DK23BA and DK23EA series of drives (thanks to Norikatsu Shigemura for submitting the patch).
- [PW] Added some missing Fujitsu MPE series drives to knowndrives table.
- [PW] Added TOSHIBA MK4019GAX, TOSHIBA MK6409MAV, and QUANTUM FIREBALLlct15 20 to knowndrives table.
- [EM] Fixup example command output for FreeBSD
- [PW] Added Maxtor DiamondMax 80 family to knowndrives table.
- [EM] Catch up FreeBSD code to switch PROJECTHOME to PACKAGE\_HOME PAGE macros.
- [BA] smartd: now watches stdout/stderr when trying to run mail, mailx or mail warning script, and reports any output to SYSLOG. This gives a clearer error message if something is wrong.
- [BA] smartd: Solaris init script modified to accomodate grep that lacks '-q' quiet option. Also check for running process to kill on stop.
- [PW] Added some missing Seagate Barracuda 7200.7 and 7200.7 Plus drives to knowndrives table.
- [PW] Added Maxtor DiamondMax Plus 60 family and Seagate U Series 5 20413 to knowndrives table.
- [BA] smartd: under Solaris, made default mailer be 'mailx' not 'mail', since Solaris 'mail' does not accept a '-s' argument. A workaround for Solaris users of earlier versions is to have '-M exec /bin/mailx' in their smartd.conf config file.
- [DG] some SCSI controllers don't like odd length transfers so make sure LOG SENSE transfers are rounded up to an even number when an odd length is reported (i.e. there is a double fetch, the first to find the length, the second gets the data)
- [BA] smartd man pages: under Solaris, correct section numbers in the 'See also' section.
- [KS/BA] smartd man page: describe how to set Solaris syslog.conf file to catch all messages. Give correct Solaris SYSLOG default path /var/adm/messages in man pages.
- [BA] smartd: incorporated Debian startup script submitted by user.

[BA] smartctl: modified printing of self-test log entry number. Seagate firmware can leave 'holes' in the self-test log while a test is actually running. We now print entry numbers consistently in this case, not assuming that entries are contiguous.

[PW] Added QUANTUM FIREBALL CX10.2A and Western Digital Caviar AC23200L to knowndrives table.

[PW] Added QUANTUM FIREBALLlct20 20 to knowndrives table.

[PW] Added Maxtor DiamondMax Plus D740X family to knowndrives table.

[PW] Added IBM Travelstar 32GH, 30GT, and 20GN family to knowndrives table.

[BA] Slackware init script modified to search for /etc/slackware-version rather than /etc/slackware-release.

[PW] Added Seagate Barracuda ATA II family and TOSHIBA MK4019GAXB to knowndrives table.

[GG] explain howto use autoreconf in autogen.sh

[KS] Makefile.am/configure.in: changed manual page sections for Solaris.

[BA] smartd: reduced number of scheduled self-test messages if test already run in current hour.

[PW] Added Maxtor DiamondMax Plus 8 family to knowndrives table.

[BA] linux: check for linux/hdreg.h. If it's there, use it. If not, provide the necessary definitions ourselves.

[PW] Removed warning for IBM Deskstar 40GV & 75GXP series drives with TXAOA5AA firmware

[PW] Added IBM Travelstar 25GS, 18GT, and 12GN family to knowndrives table.

[PW] Added IBM/Hitachi Travelstar 60GH & 40GN family to knowndrives table.

[BA] smartd: made '-s' Directive more efficient. Now store compiled regex, and re-use. If device lacks certain self-test capabilities, track it and don't try again.

[BA] smartd: made memory allocation for device lists completely dynamic (eliminating compile-time maximum length constants).

[PW] Removed warning for SAMSUNG SP0802N with TK100-23 firmware

[PW] Added Seagate Barracuda ATA IV family to knowndrives table.

[BA] smartd: reduce per-device memory footprint by making mail-warning info dynamically allocated. Also remove potential memory leak if use has -m Directive twice and keeps reloading the config file (highly unlikely this would ever be noticed!)

[DG] smartd: added SCSI scheduled self-tests (Background short or extended).

[BA] smartd: can now run scheduled offline immediate and self-tests. See man page and -s Directive for details.

[GG] don't include manpages in make-dist-tarball.

[BA] smartctl: on-line examples given with -h are now correct for solaris and linux, but wrong for freebsd. Ed?

[BA] smartd: man page now explains device scanning for solaris as well as linux and freebsd.

[BA] smartd/smartctl: man pages now report correct CVS tag release date, and executables '-V' options reports more build info.

smartmontools 5.26

[BA] Improved user messages that appear from 'make install'

[PW] Removed warning for SAMSUNG SP1213N with firmware TL100-23

[BA] incorporated SuSE init script from user.

[DG] if SCSI device is read only, then open it read only.

[BA] when compiled on non-supported system (NOT linux, freebsd or solaris) then the run-time error messages now clearly say 'your system is not supported' and give clear directions.

[BA] ./configure script now works correctly on SuSE linux boxes

[BA] minor improvements to man pages

[BA] simplified detection of packet (ATAPI, CD) devices.

[BA] init script (redhat, mandrake, yellowdog) now uses correct strings for translation and is slightly more standard.

[DG] smartctl: output scsi Seagate vendor pages for disks (not tapes)

smartmontools 5.25

Note: there was no '5.24' release. From this point on, even numbered releases will be 'stable' ones and odd numbered releases will be unstable/testing/development ones.

[DG] smartd/smartctl: changed scsiClearControlGLTSD() to scsiSetControlGLTSD() with an 'enabled' argument so '-S on' and '-S off' work for SCSI devices (if changing GLTSD supported).

[BA] smartd/smartctl: wired in scsiClearControlGLTSD(). Could still use a corresponding Set function. Left stubs for this purpose.

[DG] scsicmds: added scsiClearControlGLTSD() [still to be wired in]

[BA] smartctl: make SCSI -T options behave the same way as the ATA ones.

[DG] smartctl: output scsi transport protocol if available

[DG] scsi: stop device scan in smartd and smartctl if badly formed mode response [heuristic to filter out USB devices before we (potentially) lock them up].

[BA] smartd: deviceclose() -> CloseDevice(). Got rid of SCSIDEVELOPMENT macro-enabled code. Added -W to list of gcc specific options to always enable. Made code clean for -W warnings.

[PW] Added Maxtor DiamondMax VL 30 family to knowndrives table.

[DG] scsi: add warning (when '-l error' active) if Control mode page GLTSD bit is set (global disable of saving log counters)

[DG] scsi: remember mode sense cmd length. Output trip temperature from IE lpage (IBM extension) when unavailable from temp lpage.

[BA] smartd: for both SCSI and ATA now warns user if either the number of self-test errors OR timestamp of most recent self-test error have increased.

[DG] smartctl: output Seagate scsi Cache and Factory log pages (if available) when vendor attributes chosen

[DG] smartd: add scsiCountFailedSelfTests() function.

[DG] Do more sanity checking of scsi log page responses.

[BA] smartd: now warns user if number of self-test errors has increased for SCSI devices.

[BA] smartd: warn user if number of ATA self-test errors increases (as before) OR if hour time stamp of most recent self-test error changes.

[DG] More checks for well formed mode page responses. This has the side effect of stopping scans on bad SCSI implementations (e.g. some USB disks) prior to sending commands (typically log sense) that locks them up.

[PW] Added Western Digital Caviar family and Caviar SE family to knowndrives table.

[BA] smartd: added -l daemon (which is the default value if -l is not used).

[PW] Added Seagate Barracuda ATA V family to knowndrives table.

[BA] smartd: added additional command line argument -l FACILITY or --logfacility FACILITY. This can be used to redirect messages from smartd to a different file than the one used by other system daemons.

[PW] Added Seagate Barracuda 7200.7, Western Digital Protege WD400EB, and Western Digital Caviar AC38400 to knowndrives table.

[BA] smartd: scanning should now also work correctly for devfs WITHOUT traditional links /dev/hd[a-t] or /dev/sd[a-z].

- [PW] Added Maxtor 4W040H3, Seagate Barracuda 7200.7 Plus, IBM Deskstar 120GXP (40GB), Seagate U Series 20410, Fujitsu MHM2100AT, MHL2300AT, MHM2150AT, and IBM-DARA-212000 to knowndrives table.
- [PW] Added remaining Maxtor DiamondMax Plus 9 models to knowndrives table.
- [EM] smartd: If no matches found, then return 0, rather than an error indication, as it just means no devices of the given type exist. Adjust FreeBSD scan code to mirror Linux version.
- [BA] smartd: made device scan code simpler and more robust. If too many devices detected, warn user but scan as many as possible. If error in scanning, warn user but don't die right away.
- [EM] smartd: To keep as consistent as possible, migrate FreeBSD devicescan code to also use glob(3). Also verified clean compile on a 4.7 FreeBSD system.
- [BA] smartd: Modified device scan code to use glob(3). Previously it appeared to have trouble when scanning devices on an XFS file system, and used non-public interface to directory entries. Problems were also reported when /dev/ was on an ext2/3 file system, but there was a JFS partition on the same disk.
- [BA] Clearer error messages when device scanning finds no suitable devices.
- [EM] FreeBSD: Fixup code to allow for proper compilation under -STABLE branch.

#### smartmontools 5.23

- [BA] smartd: didn't close file descriptors of ATA packet devices that are scanned. Fixed.
- [BA] Added reload/report targets to the smartmontools init script.
  - reload: reloads config file
  - report: send SIGUSR1 to check devices now

#### smartmontools 5.22

- [EM] Fix compile issues for FreeBSD < 5-CURRENT.
- [PW] Added Fujitsu MHM2200AT to knowndrives table.
- [BA] To help catch bugs, clear ATA error structures before all ioctl calls. Disable code that attempted to time-out on SCSI devices when they hung (doesn't work).
- [BA] Documented STATUS/ERROR flags added by [PW] below.
- [BA] Improved algorithm to recognize ATA packet devices. Should no longer generate SYSLOG kernel noise when user tries either smartd or smartctl on packet device (CD-ROM or DVD). Clearer warning messages from smartd when scanning ATA packet device.

- [PW] Added TOSHIBA MK4025GAS to knowndrives table.
- [PW] Added a textual interpretation of the status and error registers in the SMART error log (ATA). The interpretation is command-dependent and currently only eight commands are supported (those which produced errors in the error logs that I happen to have seen).
- [BA] added memory allocation tracking to solaris code.  
Fixed solaris signal handling (reset handler to default after first call to handler) by using sigset. Added HAVE\_SIGSET to configure.in
- [CD] solaris port: added SCSI functionality to solaris stubs.
- [BA] smartd: attempt to address bug report about smartd hanging on USB devices when scanning:  
[https://bugzilla.redhat.com/bugzilla/show\\_bug.cgi?id=107615](https://bugzilla.redhat.com/bugzilla/show_bug.cgi?id=107615)  
Set a timeout of SCSITIMEOUT (nominally 7 seconds) before giving up.
- [EM] smartd: DEVICESCAN will follow links in a devfs filesystem and make sure the end point is a disc. Update documentation, added note about FreeBSD scanning
- [BA] smartd: DEVICESCAN also looks for block devices in /dev. Updated documentation. Now scans for up to 20 ATA devices /dev/hda-t rather than previous 12 /dev/hda-1.
- [EM] smartd: mirror the FreeBSD DEVICESCAN logic for Linux, so that smartd now scans only devices found in /dev/. Also, make utility memory functions take a line number and file so that we report errors with the correct location.
- [GG] add a note about Debian bug #208964 to WARNINGS.
- [BA] smartctl: -T verypermissive option broken. Use -T verpermissive until the next release, please.
- [BA] Syntax mods so that code also compiles on Solaris using Sun Workshop compiler. Need -xmemalign li -xCC flags for cc.

smartmontools 5.21

- [DK] Changed configure.in so -Wall is only included if gcc is used (this is a gcc specific flag) and -fsignedchar is not used at all (this is a gcc specific compiler flag).
- [BA] Modifications so that code now compiles under solaris. Now all that's needed (:-) is to fill in os\_solaris.[hc]. Added os\_generic.[hc] as guide to future ports. Fixed -D option of smartd (no file name). Modified -h opt of smartd/smartctl to work properly with solaris getopt().
- [EM] Update MAN pages with notes that 3ware drives are NOT supported

under FreeBSD. Cleanup FreeBSD warning message handling.

[EM] FreeBSD only: Fix first user found bug....I guess I was making the wrong assumption on how to convert ATA devnames to channel/unit numbers.

[EM] Allow for option --enable-sample to append '.sample' to installed smartd.conf and rc script files. Also, let rc script shell setting be determined by configure

[EM] Minor autoconf update to include -lcam for FreeBSD

[EM] Add conditional logic to allow FreeBSD to compile pre-ATAng.  
-- note, not tested  
Add some documentation to INSTALL for FreeBSD.

[EM] Implement SCSI CAM support for FreeBSD. NOTE: I am not an expert in the use of CAM. It seems to work for me, but I may be doing something horribly wrong, so please exercise caution.

[EM] Switch over to using 'atexit' rather than 'on\_exit' routine. This also meant we needed to save the exit status elsewhere so our 'Goodbye' routine could examine it.

[EM] Move the DEVICESCAN code to os specific files. Also moved some of the smartd Memory functions to utility.c to make available to smartctl.

[EM] Code janitor work on os\_freebsd.c.

[EM] Added os\_freebsd.[hc] code. Additional code janitor work.

[BA] Code janitor working, moving OS dependent code into os\_linux.[hc].

[GG] conditionally compile os\_{freebsd,linux}.o depending on host architecture

[PW] Print estimated completion time for tests

[BA] Added -F samsung2 flag to correct firmware byte swap.  
All samsung drives with \*-23 firmware revision string.

smartmontools 5.20

[GG] Fixed broken Makefile.am (zero length smartd.conf.5 was being created), fix broken uninstall/distcheck targets

[FM] Improved Slackware init script added to /etc/smartd.initd

smartmontools 5.19 [NOTE CHANGE OF RELEASE NUMBERING]

[BA] smartctl: added '-T verypermissive' option which is equivalent to giving '-T permissive' many times.

[BA] Try harder to identify from IDENTIFY DEVICE structure if SMART supported/enabled. smartd now does a more thorough job of trying to assess this before sending a SMART status command to find out for sure.

- [BA] smartctl: it's now possible to override the program's guess of the device type (ATA or SCSI) with -d option.
- [BA] try hard to avoid sending IDENTIFY DEVICE to packet devices (CDROMS). They can't do SMART, and this generates annoying syslog messages. At the same time, identify type of Packet device.
- [BA] smartctl: Can now use permissive option more than once, to control how far to go before giving up.
- [BA] smartd: if user asked to monitor either error or self-test logs (-l error or -l selftest) WITHOUT monitoring any of the Attribute values, code will SEGV. For 5.1-18 and earlier, a good workaround is to enable Auto offline (-o on).
- [BA] smartctl: If enable auto offline command given, update auto offline status before printing capabilities.
- [GG] Make autotools build the default, remove autotools.diff
- [GG] Add auto{conf,make} support, not enabled by default.
- [BA] Eliminated #include <linux/hdreg.h> from code. This should simplify porting to solaris, FreeBSD, etc. The only linux-specific code is now isolated to three routines, one for SCSI, one for Escalade, one for ATA.

smartmontools 5.1-18

- [BA] smartd: fixed serious bug - Attributes not monitored unless user told smartd to ignore at least one of them!

smartmontools 5.1-17

- [BA] Default runlevels for smartd changed from 3 and 5 to 2, 3, 4, and 5.
- [BA] Removed as much dynamic memory allocation as possible from configuration file parsing. Reloading config file, even in presence of syntax errors etc. should not cause memory leaks.
- [PW] It is no longer permissible for the integer part (if any) of arguments to --report and --device to be followed by non-digits. For example, the "foo" in --report=ioctl,2foo was previously ignored, but now causes an error.
- [BA] smartd: added -q/--quit command line option to specify under what circumstances smartd should exit. The old -c/--checkonce option is now obsoleted by this more general-purpose option.
- [BA] smartd now responds to a HUP signal by re-reading its configuration file /etc/smartd.conf. If there are errors in this file, then the configuration file is ignored and smartd continues to monitor the devices that it was monitoring prior to receiving the HUP signal.
- [BA] Now correctly get SMART status from disks behind 3ware controllers, thanks to Adam Radford. Need 3w-xxxx driver

version 1.02.00.037 or later. Previously the smartmontools SMART status always returned "OK" for 3ware controllers.

- [BA] Additional work on dynamic memory allocation/deallocation. This should have no effect on smartctl, but clears that way for smartd to dynamically add and remove entries. It should also now be easier to modify smartd to re-read its config file on HUP (which is easy) without leaking memory (which is harder). The philosophy is that memory for data structures in smartd is now allocated only on demand, the first time it is needed.
- [BA] smartd: finished cleanup. Now use create/rm functions for cfgentries and dynamic memory allocation almost everywhere. Philosophy: aggressively try and provoke SEGV to help find bad code.
- [BA] Added SAMSUNG SV0412H to knowndrives table.
- [BA] smartd: if DEVICESCAN used then knowndrives table might not set the -v attributes correctly -- may have been the same for all the drives. Cleaned up some data structures and memory allocation to try and ensure segvs if such problems are introduced again.
- [BA] Now allow -S on and -o on for the 3ware device type. For these commands to be passed through, the stock 3ware 3w-xxxx driver must be patched (8 lines). I'll post a patch on the smartmontools home page after it's been tested by a few other people and 3ware have had a chance to look it over.

smartmontools-5.1-16

- [BA] smartd - can now monitor ATA drives behind 3ware controllers.
- [BA] smartd - changed some FATAL out of memory error messages from syslog level LOG\_INFO to LOG\_CRIT.
- [BA] smartctl - added code to look at ATA drives behind 3ware RAID controllers using the 3w-xxxx driver. Note that for technical reasons related to the 3w-xxxx driver, the "Enable Autosave", "Enable Automatic Offline" commands are not implemented. I will add this to smartd shortly.
- [BA] smartd - modified sleep loop, so that smartd no longer comes on the run queue every second. Instead, unless interrupted, it sleeps until the next polling time, when it wakes up. Now smartd also tries to wake up at exactly the right intervals (nominally 30 min) even if the user has been sending signals to it.
- [GG] add Fujitsu MHN2300AT to vendoropts\_9\_seconds.
- [EB] Fujitsu change in knowndrives ... match the whole MPD and MPE series for vendoropts\_9\_seconds.
- [BA] smartd bug, might cause segv if a device can not be opened. Was due to missing comma in char\* list. Consequence is that email failure messages might have had the wrong Subject: heading for errorcount, FAILEDhealthcheck, FAILEDreadsmartdata, FAILEDreadsmarterrorlog,

FAILEDreadsmartsefltestlog, FAILEDopendevice were all displaced by one. And FAILEDopendevice might have caused a segv if -m was being used as a smartd Directive.

smartmontools-5.1-15

- [BA] Cleaned up smartmontools.spec so that upgrading, removing and other such operations correctly preserve running behavior and booting behavior of smartd.
- [BA] Improved formatting of ATA Error Log printout, and added listing of names of commands that caused the error. Added obsolete ATA-4 SMART feature commands to table, along with obsolete SFF-8035i SMART feature command.
- [PW] Added atacmdnames.[hc], which turn command register & feature register pairs into ATA command names.
- [BA] Added conveyance self-test. Some code added for selective self-tests, but #ifdefed out.
- [BA] Modified smartd exit status and log levels. If smartd is "cleanly" terminated, for example with SIGTERM, then its exit messages are now logged at LOG\_INFO not LOG\_CRIT
- [BA] Added Attribute IDs (Fujitsu) 0xCA - 0xCE. This is decimal 202-206. Added -v switches for interpretation of Attributes 192, 198 and 201.
- [BA] Made smartmontools work with any endian order machine for:
  - SMART selftest log
  - SMART ATA error log
  - SMART Attributes values
  - SMART Attributes thresholds
  - IDENTIFY DEVICE information
  - LOG DIRECTORYSmartmontools is now free of endian bias and works correctly on both little- and big-endian hardware. This has been tested by three independent PPC users on a variety of ATA and SCSI hardware.
- [DG] Check that certain SCSI command responses are well formed. If IEC mode page response is not well formed exit smartctl. This is to protect aacraid. smartd should ignore a aacraid device.

smartmontools-5.1-14

- [BA] smartctl: added column to -A output to show if Attributes are updated only during off-line testing or also during normal operation.

smartmontools-5.1-13

- [BA] smartd: attempt to enable/disable automatic offline testing even if the disk appears not to support it. Now the same logic as smartctl.
- [BA] Added definition of Attribute 201, soft read error rate.
- [BA] Added IBM/Hitachi IC35L120AVV207-1 (GXP-180) and corresponding 8MB Cache GXP-120 to drive database.

[BA] smartd: if DEVICESCAN Directive used in smartd.conf, and -I, -R or -r Directives used in conjunction with this, got segv errors. Fixed by correcting memory allocation calls.

[BA] smartd: enable automatic offline testing was broken due to cut-and-paste error that disabled it instead of enabling it. Thanks to Maciej W. Rozycki for pointing out the problem and solution.

[BA] Fixed "spelling" of some Attribute names to replace spaces in names by underscores. (Fixed field width easier for awk style parsing.)

[BA,GF] Added mods submitted by [GF] to support Attribute 193 being load/unload cycles. Add -v 193,loadunload option, useful for Hitachi drive DK23EA-30, and add this drive to knowndrive.c Add meaning of attribute 250 : Read error retry rate

smartmontools-5.1-12

[BA] Added another entry for Samsung drives to knowndrive table.

[DG] Refine SCSI log sense command to do a double fetch in most cases (but not for the TapeAlert log page). Fix TapeAlert and Self Test log page response truncation.

[PW] Added 'removable' argument to -d Directive for smartd. This indicates that smartd should continue (rather than exit) if the device does not appear to be present.

[BA] Modified smartmontools.spec [Man pages location] and smartd.initd [Extra space kills chkconfig!] for Redhat 6.x compatibility (thanks to Gerald Schnabel).

smartmontools-5.1-11

[EB] Add another Fujitsu disk to knowndrives.c

[GG] match for scsi/ and ide/ in case of devfs to exclude false positives

[BA] If SCSI device listed in /etc/smartd.conf fails to open or do SMART stuff correctly, or not enough space to list all SCSI devices, fail with error unless -DSCSIDEVELOPMENT set during compile-time.

[BA] Added automatic recognition of /dev/i\* (example: /dev/ide/...) as an ATA device.

[DG] Add "Device type: [disk | tape | medium changer | ...] line to smartctl -i output for SCSI devices.

[PW] Fixed bug in smartd where test email would be sent regularly (for example, daily if the user had specified -M daily) instead of just once on startup.

[KM] More TapeAlert work. Added translations for media changer alerts. TapeAlert support reported according to the log page presence. ModeSense not attempted for non-ready tapes (all drives do not support this after all). Get peripheral type from

Inquiry even if drive info is not printed. Add QUIETON()  
QUIETOFF() to TapeAlert log check.

[BA] Stupid bug in atacmds.c minor\_str[] affected ataVersionInfo().  
Two missing commas meant that minor\_str[] had two few elements,  
leading to output like this:  
Device Model: Maxtor 6Y120L0  
Serial Number: Y40BF74E  
Firmware Version: YAR41VW0  
Device is: Not in smartctl database [for details use: -P showall]  
ATA Version is: 7  
ATA Standard is: 9,minutes  
^^^^^^^^^^  
Missing commas inserted.

[BA] Fixed smartd bug. On device registration, if ATA device did  
not support SMART error or self-test logs but user had asked to  
monitor them, an attempt would be made to read them anyway,  
possibly generating "Drive Seek" errors. We now check that  
the self-test and error logs are supported before trying to  
access them the first time.

[GG/BA] Fixed bug where if SMART ATA error log not supported,  
command was tried anyway. Changed some error printing to use  
print handlers.

[GG] Makefile modifications to ease packaging

[DG] Did work for TapeAlerts (SCSI). Now can detect /dev/nst0 as a  
SCSI device. Also open SCSI devices O\_NONBLOCK so they don't  
hang on open awaiting media. The ATA side should worry about  
this also: during a DEVICESCAN a cd/dvd device without media  
will hang. Added some TapeAlert code suggested by Kai Makisara.

smartmontools-5.1-10

[PW] Extended the -F option/Directive to potentially fix other firmware  
bugs in addition to the Samsung byte-order bug. Long option name is  
now --firmwarebug and the option/Directive accepts an argument  
indicating the type of firmware bug to fix.

[BA] Fixed a bug that prevented the enable automatic off-line  
test feature from enabling. It also prevented the enable Attribute  
autosave from working. See CVS entry for additional details.

[PW] Modified the -r/--report option (smartctl and smartd) to allow the  
user to specify the debug level as a positive integer.

[BA] Added --log directory option to smartctl. If the disk  
supports the general-purpose logging feature set (ATA-6/7)  
then this option enables the Log Directory to be printed.  
This Log Directory shows which device logs are available, and  
their lengths in sectors.

[PW] Added -P/--presets option to smartctl and -P Directive to smartd.

[GG] Introduce different exit codes indicating the type of problem  
encountered for smartd.

[DG] Add non-medium error count to '-l error' and extended self test

duration to '-l selftest'. Get scsi IEs and temperature changes working in smartd. Step over various scsi disk problems rather than abort smartd startup.

- [DG] Support -l error for SCSI disks (and tapes). Output error counter log pages.
- [BA] Added -F/--fixbyteorder option to smartctl. This allows us to read SMART data from some disks that have byte-reversed two- and four-byte quantities in their SMART data structures.
- [BA] Fixed serious bug: the -v options in smartd.conf were all put together and used together, not drive-by-drive.
- [PW] Added knowndrives.h and knowndrives.c. The knowndrives array supersedes the drivewarnings array.
- [GG] add {-p,--pidfile} option to smartd to write a PID file on startup. Update the manpage accordingly.
- [DG] Fix scsi smartd problem detecting SMART support. More cleaning and fix (and rename) scsiTestUnitReady(). More scsi renaming.
- [BA] Fixed smartd so that if a disk that is explicitly listed is not found, then smartd will exit with nonzero status BEFORE forking. If a disk can't be registered, this will also be detected before forking, so that init scripts can react correctly.
- [BA] Replaced all linux-specific ioctl() calls in atacmds.c with a generic handler smartcommandhandler(). Now the only routine that needs to be implemented for a given OS is os\_specific\_handler(). Also implemented the --report ataioctl. This provides two levels of reporting. Using the option once gives a summary report of device IOCTL transactions. Using the option twice give additional info (a printout of ALL device raw 512 byte SMART data structures). This is useful for debugging.
- [DG] more scsi cleanup. Output scsi device serial number (VPD page 0x80) if available as part of '-i'. Implement '-t offline' as default self test (only self test older disks support).
- [BA] Changed crit to info in loglevel of smartd complaint to syslog if DEVICESCAN enabled and device not found.
- [BA] Added -v 194,10xCelsius option/Directive. Raw Attribute number 194 is ten times the disk temperature in Celsius.
- [DG] scsicmds.[hc] + scsiprint.c: clean up indentation, remove tabs. Introduce new intermediate interface based on "struct scsi\_cmnd\_io" to isolate SCSI generic commands + responses from Linux details; should help port to FreeBSD of SCSI part of smartmontools. Make SCSI command builders more parametric.

smartmontools-5.1-9

- [BA] smartctl: if HDIO\_DRIVE\_TASK ioctl() is not implemented (no kernel support, then try to assess drive health by examining Attribute values/thresholds directly.
- [BA] smartd/smartctl: added -v 200,writeerrorcount option/Directive

for Fujitsu disks.

- [BA] smartd: Now send email if any of the SMART commands fails, or if open()ing the device fails. This is often noted as a common disk failure mode.
- [BA] smartd/smartctl: Added -v N,raw8 -v N,raw16 and -v N,raw48 Directives/Options for printing Raw Attributes in different Formats.
- [BA] smartd: Added -r ID and -R ID for reporting/tracking Raw values of Attributes.
- [BA] smartd/smartctl: Changed printing of spin-up-time attribute raw value to reflect current/average as per IBM standard.
- [BA] smartd/smartctl: Added -v 9,seconds option for disks which use Attribute 9 for power-on lifetime in seconds.
- [BA] smartctl: Added a warning message so that users of some IBM disks are warned to update their firmware. Note: we may want to add a command-line flag to disable the warning messages. I have done this in a general way, using regexp, so that we can add warnings about any type of disk that we wish...

smartmontools-5.1-7

- [BA] smartd: Created a subdirectory examplescripts/ of source directory that contains executable scripts for the -M exec PATH Directive of smartd.

smartmontools-5.1-5

- [BA] smartd: DEVICESCAN in /etc/smartd.conf can now be followed by all the same Directives as a regular device name like /dev/hda takes. This allows one to use (for example):  
DEVICESCAN -m root@example.com  
in the /etc/smartd.conf file.
- [BA] smartd: Added -c (--checkonce) command-line option. This checks all devices once, then exits. The exit status can be used to learn if devices were detected, and if smartd is functioning correctly. This is primarily for Distribution scripters.
- [BA] smartd: Implemented -M exec Directive for smartd.conf. This makes it possible to run an arbitrary script or mailing program with the -m option.
- [PW] smartd: Modified -M Directive so that it can be given multiple times. Added -M exec Directive.

smartmontools-5.1-4

- [BA] Fixed bug in smartctl pointed out by Pierre Gentile. -d scsi didn't work because tryata and tryscsi were reversed -- now works on /devfs SCSI devices.

[BA] Fixed bug in smartctl pointed out by Gregory Goddard <ggoddard@ufl.edu>. Manual says that bit 6 of return value turned on if errors found in smart error log. But this wasn't implemented.

smartmontools-5.1-3

[BA] Modified printing format for 9,minutes to read Xh+Ym not X h + Y m, so that fields are fixed width.

[BA] Added Attribute 240 "head flying hours"

smartmontools-5.1.1

[BA] As requested, local time/date now printed by smartctl -i

[PW] Added "help" argument to -v for smartctl

[PW] Added -D, --showdirectives option to smartd

[DG] add '-l selftest' capability for SCSI devices (update smartctl.8)

[BA] smartd,smartctl: added additional Attribute modification option -v 220,temp and -v 9,temp.

[PW] Renamed smartd option -X to -d

START OF SMARTMONTOOLS 5.1 series

smartmontools-5.0.50

[PW] Changed smartd.conf Directives -- see man page

[BA/DG] Fixed uncommented comment in smartd.conf

[DG] Correct 'Recommended start stop count' for SCSI devices

[PW] Replaced smartd.conf directive -C with smartd option -i

[PW] Changed options for smartctl -- see man page.

[BA] Use strerror() to generate system call error messages.

[BA] smartd: fflush() all open streams before fork().

[BA] smartctl, smartd simplified internal handling of checksums for simpler porting and less code.

smartmontools-5.0.49

[PW] smartd --debugmode changed to --debug

[BA] smartd/smartctl added attribute 230 Head Amplitude from IBM DPTA-353750.

[PW] Added list of proposed new options for smartctl to README.

[PW] smartd: ParseOpts() now uses getopt\_long() if HAVE\_GETOPT\_LONG is defined and uses getopt() otherwise. This is controlled by CPPFLAGS in the Makefile.

[BA] smartd: Fixed a couple of error messages done with perror() to redirect them as needed.

#### smartmontools-5.0.48

[BA] smartctl: The -O option to enable an Immediate off-line test did not print out the correct time that the test would take to complete. This is because the test timer is volatile and not fixed. This has been fixed, and the smartctl.8 man page has been updated to explain how to track the Immediate offline test as it progresses, and to further emphasize the differences between the off-line immediate test and the self-tests.

[BA] smartd/smartctl: Added new attribute (200) Multi\_Zone\_Error\_Rate

[BA] smartctl: modified so that arguments could have either a single - as in -ea or multiple ones as in -e -a. Improved warning message for device not opened, and fixed error in redirection of error output of HD identity command.

[PW] smartd: added support for long options. All short options are still supported; see manpage for available long options.

[BA] smartctl. When raw Attribute value was 2^31 or larger, did not print correctly.

#### smartmontools-5.0.46

[BA] smartd: added smartd.conf Directives -T and -s. The -T Directive enables/disables Automatic Offline Testing. The -s Directive enables/disables Attribute Autosave. Documentation and example configuration file updated to agree.

[BA] smartd: user can make smartd check the disks at any time (ie, interrupt sleep) by sending signal SIGUSR1 to smartd. This can be done for example with:

kill -USR1 <pid>

where <pid> is the process ID number of smartd.

[EB] scsi: don't trust the data we receive from the drive too much. It very well might have errors (like zero response length). Seen on Megaraid logical drive, and verified in the driver source.

[BA] smartd: added Directive -m for sending test email and for modifying email reminder behavior. Updated manual, and sample configuration file to illustrate & explain this.

[BA] smartd: increased size of a continued smartd.conf line to 1023 characters.

[BA] Simplified Directive parsers and improved warning/error messages.

#### smartmontools-5.0.45

[EB] Fixed bug in smartd where testunitready logic inverted prevented functioning on scsi devices. The bug in question only affects smartd users with scsi devices. To see if your version of smartd has the testunitready() bug, do

```
smartd -V
If the version of the module smartd.c in a line like:
  Module: smartd.c      revision: 1.66  date: 2002/11/17
has a revision greater than or equal to 1.30, and less than or equal to
1.64, then your version of the code has this problem.
This problem affected releases starting with RELEASE_5_0_16 up to and
including RELEASE_5_0_43.
```

[BA] Added testunitnotready to smartctl for symmetry with smartd.

[SB] added Czech descriptions to .spec file
[SB] corrected comment in smartd.conf example

[BA] Changed way that entries in the ATA error log are printed,
to make it clearer which is the most recent error and
which is the oldest one.

NOTE: All changes made prior to this point were done by Bruce Allen
[BA] although several of them had been suggested by earlier postings
by Stanislav Brabec [SB].

#### smartmontools-5.0.43

Changed Temperature\_Centigrade to Temperature\_Celsius.
The term "Centigrade" ceased to exist in 1948. (c.f
<http://www.bartleby.com/64/C004/016.html>).

#### smartmontools-5.0.42

Modified SCSI device check to also send warning emails if
requested in directives file.

Added a new smartd configuration file Directive: -M ADDRESS.
This sends a single warning email to ADDRESS for failures or
errors detected with the -c, -L, -l, or -f Directives.

#### smartmontools-5.0.38

Modified perror() statements in atacmds.c so that printout for SMART
commands errors is properly suppressed or queued depending upon users
choices for error reporting modes.

Added Italian descriptions to smartmontools.spec file.

Started implementing send-mail-on-error for smartd; not yet enabled.

Added -P (Permissive) Directive to smartd.conf file to allow SMART
monitoring of pre-ATA-3 Rev 4 disks that have SMART but do not have
a SMART capability bit.

Removed charset encodings from smartmontools.spec file for non-English
fields.

#### smartmontools-5.0.32

Added manual page smartd.conf.5 for configuration file.

smartctl: Missing ANSI prototype in failuretest(); fixed.

smartctl: Checksum warnings now printed on stdout, or are silent,

depending upon -q and -Q settings.

#### smartmontools-5.0.31

Changed Makefile so that the -V option does not reflect file state before commit!

smartctl: added new options -W, -U, and -P to control if and how the smartctl exits if an error is detected in either a SMART data structure checksum, or a SMART command returns an error.

modified manual page to break options into slightly more logical categories.

reformatted 'usage' message order to agree with man page ordering

modified .spec file so that locale information now contains character set definition. Changed pt\_BR to pt since we do not use any aspect other than language. See man setlocale.

#### smartmontools-5.0.30

smartctl: added new options -n and -N to force device to be ATA or SCSI  
smartctl: no longer dies silently if device path does not start/dev/X  
smartctl: now handles arbitrary device paths

#### smartmontools-5.0.29

Modified .spec file and Makefile to make them more compliant with the "right" way of doing things.

#### smartmontools-5.0.26

Fixed typesetting error in man page smartd.8

Removed redundant variable (harmless) from smartd.c

#### smartmontools-5.0.25

Added a new directive for the configuration file. If the word DEVICESCAN appears before any non-commented material in the configuration file, then the config file will be ignored and the devices will be scanned.

#### smartmontools-5.0.24

Note: it has now been confirmed that the code modifications between 5.0.23 and 5.0.24 have eliminated the GCC 3.2 problems. Note that there is a GCC bug however, see #8404 at  
<http://gcc.gnu.org/cgi-bin/gnatsweb.pl?database=gcc&cmd=query>  
[http://gcc.gnu.org/bugzilla/show\\_bug.cgi?id=8404](http://gcc.gnu.org/bugzilla/show_bug.cgi?id=8404)

Added new Directive for Configuration file:

-C <N> This sets the time in between disk checks to be <N> seconds apart. Note that although you can give this Directive multiple times on different lines of the configuration file, only the final value that is given has an effect, and applies to all the disks. The default value of <N> is 1800 sec, and the minimum allowed value is ten seconds.

Problem wasn't the print format. F.L.W. Meunier <0@pervalidus.net> sent me a gcc 3.2 build and I ran it under a debugger. The

problem seems to be with passing the very large (2x512+4) byte data structures as arguments. I never liked this anyway; it was inherited from smartsuite. So I've changed all the heavyweight functions (ATA ones, anyone) to just passing pointers, not hideous kB size structures on the stack. Hopefully this will now build OK under gcc 3.2 with any sensible compilation options.

smartmontools-5.0.23

Because of reported problems with GCC 3.2 compile, I have gone thorough the code and explicitly changed all print format parameters to correspond EXACTLY to int unless they have to be promoted to long longs. To quote from the glibc bible: [From GLIBC Manual: Since the prototype doesn't specify types for optional arguments, in a call to a variadic function the default argument promotions are performed on the optional argument values. This means the objects of type char or short int (whether signed or not) are promoted to either int or unsigned int, as appropriate.]

smartmontools-5.0.22

smartd, smartctl now warn if they find an attribute whose ID number does not match between Data and Threshold structures.

Fixed nasty bug which led to wrong number of arguments for a varargs statement, with attendant stack corruption. Sheesh! Have added script to CVS attic to help find such nasties in the future.

smartmontools-5.0.21

Eliminated some global variables out of header files and other minor cleanup of smartd.

smartmontools-5.0.20

Did some revision of the man page for smartd and made the usage messages for Directives 100% consistent.

smartmontools-5.0-19

smartd: prints warning message when it gets SIGHUP, saying that it is NOT re-reading the config file.

smartctl: updated man page to say self-test commands -0,x,X,s,S,A appear to be supported in the code. [I can't test these, can anyone report?]

smartmontools-5.0-18

smartctl: smartctl would previously print the LBA of a self-test if it completed, and the LBA was not 0 or 0xff...f However according to the specs this is not correct. According to the specs, if the self-test completed without error then LBA is undefined. This version fixes that. LBA value only printed if self-test encountered an error.

smartmontools-5.0-17

smartd has changed significantly. This is the first CVS checkin of code that extends the options available for smartd. The following options can be placed into the /etc/smartd.conf file, and control the behavior of smartd.

Configuration file Directives (following device name):

- A Device is an ATA device
- S Device is a SCSI device
- c Monitor SMART Health Status
- l Monitor SMART Error Log for changes
- L Monitor SMART Self-Test Log for new errors
- f Monitor for failure of any 'Usage' Attributes
- p Report changes in 'Prefailure' Attributes
- u Report changes in 'Usage' Attributes
- t Equivalent to -p and -u Directives
- a Equivalent to -c -l -L -f -t Directives
- i ID Ignore Attribute ID for -f Directive
- I ID Ignore Attribute ID for -p, -u or -t Directive
- # Comment: text after a hash sign is ignored
- \ Line continuation character

cleaned up functions used for printing CVS IDs. Now use string library, as it should be.

modified length of device name string in smartd internal structure to accomodate max length device name strings

removed un-implemented (-e = Email notification) option from command line arg list. We'll put it back on when implemeneted.

smartd now logs serious (fatal) conditions in its operation at loglevel LOG\_CRIT rather than LOG\_INFO before exiting with error.

smartd used to open a file descriptor for each SMART enabled device, and then keep it open the entire time smartd was running. This meant that some commands, like IOREADBLKPART did not work, since the fd to the device was open. smartd now opens the device when it needs to read values, then closes it. Also, if one time around it can't open the device, it simply prints a warning message but does not give up. Have eliminated the .fd field from data structures -- no longer gets used.

smartd now opens SCSI devices as well using O\_RDONLY rather than O\_RDWR. If someone can no longer monitor a SCSI device that used to be readable, this may well be the reason why.

smartd never checked if the number of ata or scsi devices detected was greater than the max number it could monitor. Now it does.

smartmontools-5.0-16

smartd on startup now looks in the configuration file /etc/smartd.conf for a list of devices which to include in its monitoring list. See man page (man smartd) for syntax.

smartd: close file descriptors of SCSI device if not SMART capable  
Closes ALL file descriptors after forking to daemon.

added new temperature attribute (231, temperature)

smartd: now open ATA disks using O\_RDONLY

smartmontools-5.0-11

smartd now prints the name of a failed or changed attribute into logfile, not just ID number

Changed name of -p (print version) option to -V

Minor change in philosophy: if a SMART command fails or the device appears incapable of a SMART command that the user has asked for, complain by printing an error message, but go ahead and try anyway. Since unimplemented SMART commands should just return an error but not cause disk problems, this should't cause any difficulty.

Added two new flags: q and Q. q is quiet mode - only print: For the -l option, errors recorded in the SMART error log; For the -L option, errors recorded in the device self-test log; For the -c SMART "disk failing" status or device attributes (pre-failure or usage) which failed either now or in the past; For the -v option device attributes (pre-failure or usage) which failed either now or in the past. Q is Very Quiet mode: Print no ouput. The only way to learn about what was found is to use the exit status of smartctl.

smartctl now returns sensible values (bitmask). See smartctl.h for the values, and the man page for documentation.

The SMART status check now uses the correct ATA call. If failure is detected we search through attributes to list the failed ones. If the SMART status check shows GOOD, we then look to see if their are any usage attributes or prefail attributes have failed at any time. If so we print them.

Modified function that prints vendor attributes to say if the attribute has currently failed or has ever failed.

-p option now prints out license info and CVS strings for all modules in the code, nicely formatted.

Previous versions of this code (and Smartsuite) only generate SMART failure errors if the value of an attribute is below the threshold and the prefailure bit is set. However the ATA Spec (ATA4 <=Rev 4) says that it is a SMART failure if the value of an attribute is LESS THAN OR EQUAL to the threshold and the prefailure bit is set. This is now fixed in both smartctl and smartd. Note that this is a troubled subject -- the original SFF 8035i specification defining SMART was inconsistent about this. One section says that Attribute==Threshold is pass, and another section says it is fail. However the ATA specs are consistent and say Attribute==Threshold is a fail.

smartd did not print the correct value of any failing SMART attribute. It printed the index in the attribute table, not the attribute ID. This is fixed.

when starting self-tests in captive mode ioctl returns EIO because the drive has been busied out. Detect this and don't return an error in this case. Check this this is correct (or how to fix it?)

fixed possible error in how to determine ATA standard support for devices with no ATA minor revision number.

device opened only in read-only not read-write mode. Don't need R/W access to get smart data. Check this with Andre.

smartctl now handles all possible choices of "multiple options" gracefully. It goes through the following phases of operation, in order: INFORMATION, ENABLE/DISABLE, DISPLAY DATA, RUN/ABORT TESTS. Documentation has been updated to explain the different phases of operation. Control flow through ataPrintMain() simplified.

If reading device identity information fails, try seeing if the info can be accessed using a "DEVICE PACKET" command. This way we can at least get device info.

Modified Makefile to automatically tag CVS archive on issuance of a release

Modified drive detection so minor device ID code showing ATA-3 rev 0 (no SMART) is known to not be SMART capable.

Now verify the checksum of the device ID data structure, and of the attributes threshold structure. Before neither of these structures had their checksums verified.

New behavior vis-a-vis checksums. If they are wrong, we log warning messages to stdout, stderr, and syslog, but carry on anyway. All functions now call a checksumwarning routine if the checksum doesn't vanish as it should.

Changed Read Hard Disk Identity function to get fresh info from the disk on each call rather than to use the values that were read upon boot-up into the BIOS. This is the biggest change in this release. The ioctl(device, HDIO\_GET\_IDENTITY, buf) call should be avoided in such code. Note that if people get garbled strings for the model, serial no and firmware versions of their drives, then blame goes here (the BIOS does the byte swapping for you, apparently!)

Function ataSmartSupport now looks at correct bits in drive identity structure to verify first that these bits are valid, before using them.

Function ataIsSmartEnabled() written which uses the Drive ID state information to tell if SMART is enabled or not. We'll carry this along for the moment without using it.

Function ataDoesSmartWork() guaranteed to work if the device supports SMART.

Replace some numbers by #define MACROS

Wrote Function TestTime to return test time associated with each different type of test.

Thinking of the future, have added a new function called ataSmartStatus2(). Eventually when I understand how to use the TASKFILE API and am sure that this works correctly, it will

replace ataSmartStatus(). This queries the drive directly to see if the SMART status is OK, rather than comparing thresholds to attribute values ourselves. But I need to get some drives that fail their SMART status to check it.

smartmontools-5.0-10

Removed extraneous space before printing in some error messages  
Fixed additional typos in documentation  
Fixed some character buffers that were too short for their contents.

smartmontools-5.0-9

Put project home path into all source files near the top  
Corrected typos in the documentation  
Modified Makefile so that Mandrake Cooker won't increment version number  
(unless they happen to be working on my machine, which I doubt!)

smartmontools-5.0-8:

For IBM disks whose raw temp data includes three temps. print all three

print timestamps for error log to msec precision

added -m option for Hitachi disks that store power on life in minutes

added -L option for printing self-test error logs

in -l option, now print power on lifetime, so that one can see when the error took place

updated SMART structure definitions to ATA-5 spec

added -p option

added -f and -F options to enable/disable autosave threshold parameters

changed argv parsing to use getops -- elminate buffer overflow vulnerability

expanded and corrected documentation

fixed problem with smartd. It did not actually call ataSmartEnable()! Since the argument was left out, the test always succeeded because it evaluated to a pointer to the function.

smartd: closed open file descriptors if device does not support smart. Note: this still needs to be fixed for SCSI devices

smartmontools-5.0-0 STARTED with smartsuite-2.1-2

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